Instructor: Giorgio Young **Time:** MWF 9:00AM-9:50 AM
Office: 47 Herman Brown **Classroom:** TBA
Email: `gfy1@rice.edu` **Office Hours:** TBA
Class Webpage: Look for `Math 212` on Canvas

Course content and objectives: The goals of this course include:

1. Gain familiarity with 3-dimensional space using various coordinate systems and multi-variable functions.
2. Learn to identify graphs of surfaces using various techniques.
3. Learn to identify and solve problems utilizing the dot product and cross product.
4. Explore applications of the gradient vector- its relationship to directional derivatives, Lagrange multipliers, the graph of a function, level curves and level surfaces.
5. Be able to explain the connection between Riemann sums and double integrals.
6. Identify, set-up and solve problems requiring double, line, surface, and triple integrals. Explore the meaning of these integrals in various situations.
7. Demonstrate your understanding of Green's theorem, Stokes theorem and the divergence theorem as they relate to the fundamental theorem of calculus, and recognize situations in which each theorem applies.

You should aim to not only provide solutions to problems given, but to learn the course content to the extent that you can explain why you performed each step of your solution. During class periods, we will practice doing exactly this.

Expectations: Multi-variable calculus is a difficult course. Although much of it involved generalizing single-variable concepts, it also introduces new concepts that are challenging. You should make an effort to attend and participate in every class. I encourage you to collaborate with your peers, come to office hours, and take advantage of the resources available to you.

Text: https://openstax.org/details/books/calculus-volume-3

Homework:

- There will be frequent **online homework** through Webwork, students log in at webwork.math.rice.edu. These problems will not be very difficult, but are designed to reinforce the material taught in class that day. The lowest three online homeworks will be dropped.
- There will also be **written homework** assigned at least once per week. These problems will vary from easy to challenging and are designed to get you thinking critically about the material. These will be good guides for studying for the exams. The lowest written homework will be dropped.

The homework is not pledged. You are allowed and encouraged to collaborate with your classmates on homework, but are expected to write up your solutions ***on your own***.

Exams:

- This course will have two midterms and a final exam. The first midterm will be 7-9 PM on Thursday October 3, and the second midterm will be 7-9 PM on Tuesday November 12. If you have a conflict with these dates you must let me know by the end of the first week of class. Otherwise, no excuse other than a documented medical or family emergency will be accepted for missing the exam.
- There will be a cumulative final exam. The date for the final exam is set by the Registrar's office and is not available at this time. It is the policy of the Mathematics Department that no final may be given early to accommodate student travel plans. If you make travel plans that later turn out to conflict with the scheduled exam, then it is your responsibility to either reschedule your travel plans or take a zero on the final.

Grading: 72% of your grade will be based on Midterm 1/Midterm 2/Final in a ratio of 4:4:5, 4:3:6, or 3:4:6, whichever benefits you the most, and 23% on the homework (3% from online and 20% from written assignments). While each homework will differ in the number of points, their scores will be normalized so that they each contribute the same amount to the overall homework grade. Participation in class accounts for the remaining 5 % (this includes answering questions and engaging with classmates at appropriate times). When computing final course grades, a student's exam scores are normalized against scores of all students in Math 212 this semester, not just those in this section.

Disability Support: Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services in the Allen Center.